Verification, Validation and Accreditation for HPAC 5 MBU

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Bottom Line

- The HPAC 5 Maintenance Build Update (MBU) was released, V&V information has been reviewed and potential limitations for DTRA use have been identified
- A recommendation for accreditation with limitations is under review at DTRA at this time
- We will highlight the VV&A process.

How Did We Get Here?

- Components of HPAC are part of the S&T basis for Joint Effects Model
- DTRA Reachback found it difficult to maintain configuration control due to multiple development strands and program delays
- The S&T Maintenance Build was initialized to re-baseline the HPAC configuration
  - Build 125 became HPAC 5 Maintenance Build (MB)
  - Build 168 became HPAC 5 MB Update (MBU)
- Accreditation sought for DTRA use

V&V Basis for HPAC 5 MBU

- Legacy V&V info
  - HPAC 3 and 4 (incomplete)
  - JEM 1.0 and 1.1 (incomplete)
- Current development documentation
  - Integration Contract
  - Component Developers
- Independent V&V

Development Documentation

- MB and MBU Test Reports include
  Software Requirements, SPCRs Built and Outstanding, and results of Power User Testing, API Testing, Installation Testing
- And Component V&V Reports for
  - All Source Models
  - Weather and Transport Models
  - Others Models

Independent V&V Activity – Source Term Focus

Component	Performer	Activity
CB Source Models	IDA	Wide ranging parametric testing, select detailed investigations and independent physics assessments.
	TASC	Independent comparisons against field test data. Comparative model runs.
RN Source Models	NGIC	Independent modeling of pressurized tank releases and associated transport.
	L-3	Completed regression testing against nuclear weapon reference problems and STRATCOM use cases.
	Sage	Independent comparative model analyses and comparison to limited experimental data.

Independent V&V Activity – Weather, Transport, Human Effects

Task	Performer	Activity
Non-Urban Field Trial ATD Validation	IDA	Rerun of problem sets defined for JEM
Urban Field Trial ATD Validation	IDA	Rerun of Urban 2000, JU2003 and MSG2005 for multiple versions of HPAC
DSWA Phase I PATD Validation	L-3	Confirm validation of SCIPUFF/ HPAC against unique probabilistic validation trials
Benchmarking of SWIFT against GCAT	NGIC	Planned check against higher fidelity model not completed
DEGRADE atmospheric chemistry review	IDA	Continued review of new HPAC capability and status as of MBU

Accreditation Review Committee

- Members from across DTRA R&D
- Process includes
  - Approval of Accreditation Plan
  - Review of V&V information
  - Solicit draft Summary of Assumptions Limitations & Errors (SALE) information from IV&V testers
  - Complete SALEs by component/function
  - Identify Limitations and Caveats for potential DTRA accreditation

Accreditation Considerations

- Accredit for intended DTRA use(s), but identify Limitations on use
- Candidate Limitations Summary
  - CB Source Models
  - RN Source Models
  - Other

DTRA Intended Use

- DTRA use includes responding to external RFIs, forward support by deployable teams and for operations research and analysis
- Broad applicability is needed to support:
  - Consequence assessment for WMD events
  - Targeting support to minimize collateral effects
  - Analysis pertaining to force protection, and
  - Consequence of missile intercepts

Candidate Limitations

- Model limitations have been identified based on IV&V testing and in the context of intended use and component V&V
- Accreditation is under formal review at this time
- Contact DTRA for further information

Conclusion

- Accreditation process is almost complete, awaiting official review and approval
- A VV&A report is in work documenting the process, findings and recommendations
- V&V reports have distribution limitations but requests may be made to DTRA